REMARKS

Review and reconsideration on the merits are requested.

In response to the rejection under 35 U.S.C. § 112, first paragraph, the claims have been amended to conform to the elected embodiment which is Fig. 2. As described at pages 26-27 of the specification relating to Fig. 2, thin-film cladding layer 104 is composed of an Se-doped n-type AlGaInP, and a composition-graded layer 108 composed of an undoped BGaP mixed crystal as formed on the thin-film cladding layer 104. Accordingly, claim 1 has been amended to recite that the current diffusion layer is composed of a boron-phosphide-based semiconductor having a boron compositional gradient such that the bandgap increases from the bottom surface of the current diffusion layer closest to the light-emitting layer to a top surface of a current diffusion layer.

It is respectfully submitted that the claims as amended fully comply with 35 U.S.C. § 112, and withdrawal of the foregoing rejection is respectfully requested.

Claims 1-5 and 10-12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Application Publication No. US 2003/0234400 to Udagawa (US '400) in view of U.S. Application Publication No. US 2003/0027099 to Udagawa (US '099) and U.S. Patent No. 5,008,718 to Fletcher et al and further in view of U.S. Application Publication No. US 2004/0104396 to Nakatsu et al.

Udagawa '099 was cited as disclosing a cladding layer 103 having a boron compositional gradient which increases proportionally from 0.02 to 0.98 from bottom to top (Fig. 1 and paragraph [0047]), and cites Fletcher et al as disclosing a current diffusion layer having a compositional gradient (citing Fig. 2 and column 4, lines 57-66). The reason for rejection was that it would been have obvious to modify the device of Udagawa '400 such that "each of the

cladding layer and the current diffusion layer...having a boron compositional gradient," in order to achieve better lattice matching as taught by Udagawa '099 at paragraph [0047].

Applicants traverse, and respectfully request the Examiner to reconsider in view of the amendment to the claims and the following remarks.

The claims as amended and in reference to Fig. 2, call for a current diffusion layer 108 provided on light-emitting layer 103, and a cladding layer 104 arranged between the current diffusion layer 108 and the light-emitting layer 103. The cladding layer has a bandgap at room temperature wider than that of the light-emitting layer and equal to or narrower than that of the current diffusion layer, and the current diffusion layer has a bandgap wider than that of the light-emitting layer. Further, the current diffusion layer is composed of a BP-based semiconductor having a boron compositional gradient such that the bandgap increases from the bottom surface of the current diffusion layer closest to the light-emitting layer to a top surface of the current diffusion layer.

In Udagawa '099, the composition gradient of cladding layer 103 is provided so that lattice matching of the cladding layer 103 can be established with both the well layer 104a and the silicon substrate 101 (see paragraph [0047]).

On the other hand, the current diffusion layer 108 of the invention is provided on top of the structure 11, and unlike Udagawa '099, it is not important to consider lattice-matching for the current diffusion layer 108. Thus, there is no apparent reason which would lead one of ordinary skill in the art to employ the cladding 103 of Udagawa '099 as the current diffusion layer 108 of the present invention.

Rather, as described bridging pages 19-20 of the specification, the current diffusion layer composed of a boron-phosphide based semiconductor layer having a compositional gradient has

a bandgap which gradually decreases from the current diffusion layer toward the light-emitting layer such that an increase in forward voltage of an LED and in threshold value of LDs can be prevented.

Another difference is that in Fig. 1 of Udagawa '099, the cladding layer 103 has the highest B content at positions closer to the light-emitting layer and a B content that is lower at positions further away from the light-emitting layer. This gradient arrangement is opposite that claimed in present claim 1.

So as to yet further distinguish over the prior art, claim 1 has been amended to recite that the light-emitting diode further comprises an Ohmic electrode 106 joined to the current diffusion layer 105, and has been further amended to incorporate therein the recitation of claim 7 (so as to define the material of the cladding layer). As amended, the arrangement of the compound semiconductor light-emitting diode of claim 1 is entirely different from the structure disclosed in Udagawa '099, where the cladding layer 103 having a boron compositional gradient cited by the Examiner is arranged between the light-emitting layer 104 and the substrate 101.

Withdrawal of the foregoing rejection is respectfully requested.

Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Udagawa '400 in view of Udagawa '099, Fletcher et al and Nakatsu et al, further in view of U.S. Application Publication No. US 2004/0026703 to Adomi et al. Claim 9 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Udagawa '400 in view of Udagawa '099, Fletcher et al and Nakatsu et al, further in view of U.S. Application Publication No. US 2003/0218180 to Fujiwara.

Claim 7 has been combined with claim 1, and claim 7 has then been canceled. As to claim 9, Applicants rely on the response above with respect to the rejection of claims 1-5 and 10-

12 as being unpatentable over Udagawa '400 in view of Udagawa '099, Fletcher et al and Nakatsu et al.

Claims 12 and 13 have been canceled without prejudice. Applicants reserve the right to file a continuation application directed to the canceled subject matter.

Claim 11 has been amended to conform with the amendment to claim 1.

Withdrawal of all rejections and allowance of claims 1-5, 9 and 11 is earnestly solicited.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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